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$$
\begin{aligned}
T &= 1912 \text{ Oct. } 20.527 \text{ G. M. T.} \\
\omega &= 98^\circ\ 52' \\
\Omega &= 143\ \ 18 \\
i &= 124\ \ 52 \\
q &= 1.105
\end{aligned}
\left.\vphantom{\begin{aligned}\omega\\\Omega\\i\end{aligned}}\right\}\ 1912.0
$$

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University of California,
Berkeley Astronomical Department,
November 18, 1912.

Comet *b* 1912 (Schaumasse-Tuttle).

A cablegram from Kiel, received at the Harvard College Observatory on October 20th, announced the discovery of a comet by Schaumasse at Nice on October 18th. The comet was situated about 10° south and a little west of *Regulus,* in the constellation *Sextans.* It was visible in a small telescope.

On October 21st the comet was independently discovered by Brooks at Geneva, New York.

Interest in the new comet was aroused by the announcement by Fayet and Schaumasse that the elements are nearly identical with those of Tuttle's Comet.

Tuttle's Comet was expected to reach perihelion in January, 1913. It was discovered by Horace Tuttle at Harvard College Observatory on January 4, 1858, and was found to be identical with Mechain's Comet, 1790 II. Its period is fourteen years, and it has been observed in 1871, 1885, 1899. A search ephemeris for the present return is given by Kaplan Nilso Milicevic in *Astronomische Nachrichten* 4602.

The comet has passed rapidly south and is now in the constellation *Hydra.* It is receding from the Earth and the Sun.

Our own investigations, under the direction of Professor Leuschner, are given below. The results have also been published in Lick Observatory Bulletin 220.

We used as the basis of a preliminary orbit three observations taken by Aitken at the Lick Observatory on October 21st, 22d, and 23d, respectively. There was also available the announcement by Fayet and Schaumasse regarding the probable identity with Tuttle's Comet. Making a direct solution, without assumption regarding the eccentricity and without differential correction of the orbit, we obtained an elliptic orbit ($P = 40$ years) which satisfied the three observations within the errors of observation. This preliminary orbit served as the basis of an immediate ephemeris.

A comparison of our elements with the elements of Tuttle's Comet, given by Rahts in *Astronomische Nachrichten* 3555, verified the announcement by Fayet and Schaumasse.

With Rahts's elements, we represented the first of Aitken's observations and found the following residuals:

	$\Delta\alpha$	$\Delta\delta$
O — C	$+5^\circ.5$	$-74^\circ.6$

The relatively large residuals in declination is due to the high eccentricity of the orbit (56°) and the position of perihelion, which is near the descending node. The resulting orbital motion as seen from the Earth is more nearly along an hour circle than parallel to the equator. It was therefore evident that arbitrary changes in the mean motion and the mean anomaly at some epoch might remove these residuals. The arbitrary corrections necessary to satisfy Aitken's first observation are:—

$$\Delta M = +4^\circ\ 51'.6$$
$$\Delta\mu = -6''.96$$

But a representation of the third observation (only two days later) showed that this arbitrary correction of Rahts's elements is not adequate for the construction of a good ephemeris.

Returning to our own orbit, we estimated the accuracy of the period by Professor Leuschner's method. We assumed a relatively large error of observation—namely, 5″—because Dr. Aitken found the comet difficult to measure. With this assumption, we found the interesting fact that the three given observations can be represented by any orbit ranging from an ellipse (period one year) to a parabola, so that the period of Tuttle's Comet lies within the range of possible solutions. If, therefore, we adopt the period, or mean motion of Tuttle's Comet, we should be able to represent the three observations. This can be accomplished readily from Leuschner's form of the equation of the geocentric distance, writing $G^2 + {}^1/a$ for

G^2, where a represents the adopted semi-major axis. The correction of our orbit gave a good representation of the observations, and an ephemeris was computed.

It should be noted that the average mean motion for the last revolution of the comet is 263″.04, a value larger than the osculating values given for the preceding apparitions.

It was expected that new observations would permit the determination of a still better orbit, but unfavorable weather and moonlight have prevented Dr. AITKEN from securing new measures.

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November 18, 1912.

NEW PROPER-MOTION STARS.

Among stars recently observed at Mount Hamilton with the meridian circle, there are eight that show fairly well-defined evidence of proper motion. Some of these stars are faint, and there is more interest than usual in these cases. All show at least a motion of 0″.1 per year.

The comparison with the A. G. Zone Catalogues gives the first indication of possible proper motion. Recent determinations at the Lick Observatory indicate a systematic correction to the A. G. declinations, at 39° north, of —0″.7; while the average deviation from this correction is ± 0″.6. In right ascension the average correction is $\pm\ 0^s.05$, with no systematic difference. Three times the average difference, allowing for systematic correction, may be assumed to be an indication of possible proper motion, which should be confirmed by earlier authorities, when observations exist. Of course the oldest catalogues are comparatively inaccurate, but the length of time between the epochs of the earliest and most recent observations may be considered as distributing the effect of the error in the computation of proper motion.

The following places are from Lick Observatory meridian-circle observations, with the proper motions derived from the comparison with older catalogues:—